Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Form PCT/IPEA/416
RX03P10PCT		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/JP2004/008312	14.06.2004	18.06.2003
International Patent Classification (IPC) or national classification and IPC		
Applicant		
JAPAN SCIENCE AND TECHNOLOGY AGENCY		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

   a. ☒ *(sent to the applicant and to the International Bureau)* a total of 5 sheets, as follows:

      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s))

      _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/JP Facsimile No.	Authorized officer Telephone No.

Form PCT/IPEA/409 (cover sheet) (January 2004)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/JP2004/008312

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

☐ international search (Rule 12.3 and 23.1(b))

☐ publication of the international application (Rule 12.4)

☐ international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:

pages 1-3,6-19 as originally filed/furnished

pages* 4,4/1,5,5/1 received by this Authority on 21.01.2005

pages* _____ received by this Authority on _____

☒ the claims:

nos. 2,3,5 as originally filed/furnished

nos.* _____ as amended (together with any statement) under Article 19

nos.* 1,4 received by this Authority on 21.01.2005

nos.* _____ received by this Authority on _____

☒ the drawings:

sheets fig. 1-6 as originally filed/furnished

sheets* _____ received by this Authority on _____

sheets* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/JP2004/008312

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-5	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-5	NO
Industrial applicability (IA)	Claims	1-5	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Document 1: JP 62-74048 A (Sumitomo Special Metals Co., Ltd.), 04 April 1987, entire text and fig. 1 (Family: none)

Document 2: JP 4-119604 A (Fuji Electric Co., Ltd.), 21 April 1992, entire text and fig. 1 to 7 (Family: none)

Document 3: JP 7-122414 A (Isuzu Motors Ltd.), 12 May 1995, entire text and fig. 1 to 2 (Family: none)

Claims 1 to 5

Document 1 discloses a Fe-B-R based permanent magnet material wherein a grain boundary phase that generates a high coercive force is formed with an appropriate thickness upon the symmetry groups on the surface of the sintered magnet body by forming a thin film layer of Dy, Ho, Tb or the like that has a thickness of 15 μm or less thereupon and then subjecting said thin film layer to a heat treatment.

Meanwhile, newly cited document 2 discloses a nucleation-type magnet comprising a $Nd_2Fe_{14}B$ main phase (1) that is surrounded by a Nd-rich phase (2) and a B-rich phase (3), wherein the boundaries of the Nd-rich

phase (2) that surrounds the main phase (1) generate a coercive force and the voids in the Nd-rich phase (2) are filled by adding or coating a composition that includes Dy or Pr upon the sintered Nd-Fe-B based permanent magnet bulk material so that the average film thickness reaches 0.5 μm and then subjecting the layer in question to a heat treatment at a temperature of 400 to 900°C so that the Dy or Pr permeates into the interior of the Nd-rich phase (2).

Newly cited document 3 discloses Nd-Fe-B based amorphous quenched ribbon particles wherein the coercive force changes according to the width of the Dy diffusion layer between the amorphous ribbon particles; indicates that the coercive force is relatively strong in cases when the width of the diffusion layer is between 0.4 and 0.8 μm; and further discloses the feature of adding 1 to 20% by weight of a Co-Dy alloy powder to the amorphous quenched ribbon particles in order to obtain a diffusion layer that has a thickness within said range. In other words, document 3 indicates that the Dy diffusion layer can be made to have a thickness whereby it is possible to generate a highly coercive force by adding approximately 1 to 20% by weight of a Dy component.

Therefore, it would have been easy for a person skilled in the art of the technical field in question to conceive of configuring an R-Fe-B based permanent magnet that has Dy and Tb diffused in the surface thereof by filling the voids in the Nd-rich phase with Dy or the like by means of a heat treatment at a temperature of 400 to 900°C, as disclosed in document 2, and adding approximately 1 to 20% by weight of a Dy component in order to obtain a Dy diffusion layer of a thickness that

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

is capable of generating a highly coercive force, as disclosed in document 3, when providing a grain boundary phase that generates a high coercive force by forming a thin film layer of Dy, Ho, Tb or the like and then subjecting the thin film layer to a heat treatment, as disclosed in document 1.

Furthermore, the magnetic material that is configured by employing the inventions that are disclosed in documents 2 and 3 in the invention that is disclosed in document 1 is produced from magnetic materials similar to those in the invention that is set forth in the present application by means of production methods similar to those in the invention that is set forth in the present application, as can be seen from the examples in the description of the present application; therefore, the invention in question can be considered to exhibit similar magnetic characteristics to those of the invention that is set forth in the present application.